



User Manual

Master Clock

TIME CONTROL I



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General

Westerstrand master clock TIME CONTROL I forms a combination of a controlling unit of secondary clocks, an NTP Time Server and a yearly programmer with 2 outputs for controlling different energy consumers such as electrical striking plates, buzzers for pause signalling etc. All parameters such as type of time system, impulse type and length, network parameters etc. can be configured by the user. It is also equipped with an automatic measurement function which measures the impulse voltage and current.

The programmer has fixed public holidays and summer/wintertime changing pre-programmed.

The unit offers full flexibility regarding programming working days between holidays, public holidays to weekdays, holiday periods etc.

Configuration of network settings, light intensity and other parameters is done via a WEB-browser.

Functional description

Start up

Connect power and Ethernet or USB cable to computer. Select language and time zone, then finish setup.

Power failure

In the event of a power failure, time continues to run internally in the master clock. Connected secondary clocks are corrected after a power failure by rapid pulse.

Synchronization

The clock is preset for time synchronization via internal time.

Safety

Installation and maintenance of this device must be performed by accredited personnel. This product must not be installed by unauthorized users/operators. Electrical installation of the equipment must comply with applicable electrical standards.

CAUTION:

This equipment must be serviced by an approved technician. The guarantee shall be cancelled if any modifications are made to this product.



General warning (refer to accompanying documents)



Consult instruction for use



This symbol means that according to local laws and regulations your product shall be disposed of separately from household waste. When this product reaches its end of life, take it to a recycling center designated by local authorities.

Installation

The master clock is adapted to be mounted on a DIN rail.

Note: The master clock is intended for fixed and encapsulated installation in a housing or control cabinet. We recommend Mean Well HDR-30-24 or similar as power supply.

Products intended to be connected to the mains via fixed installation must be connected via a safety switch, external fuse required.

Contacts



Pulse out: Clock drive

RS485: Not connected

Sync source: Connecting sync source



24V In: Connecting the power source

Signal Input: External control signals

Relay 1/2: Connecting relays

Connection

Connect the LAN cable to RJ45.

Connect the 24V supply voltage.

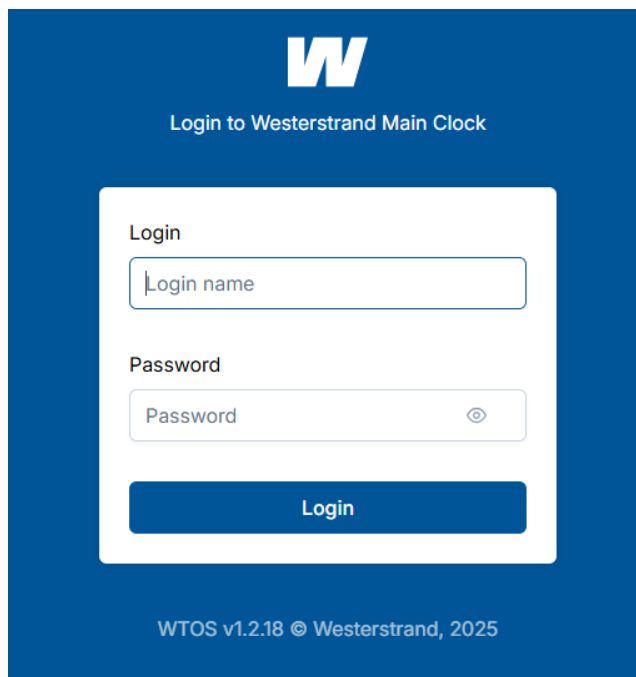
View/configure IP address on front panel

Go to the main menu and select status. Then select Ethernet network to find out which IP address the master clock has received.

Configuration using a WEB browser

Login

It is possible to login as administrator, operator or guest. The administrator has full access and can both read and change the settings in the interface. Operator can read everything but can only change alarms, time, modules, impulse output. Guest users can only read.



W

Login to Westerstrand Main Clock

Login

Login name

Password

Password

Login

WTOS v1.2.18 © Westerstrand, 2025

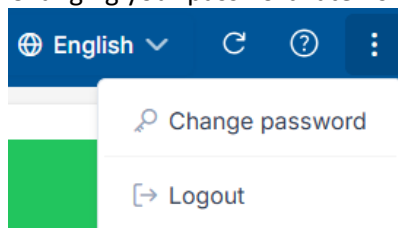
Username

admin and optional for operators and guests.

Password

When logging in for the first time, you need to choose a password for admin. For operator and guest, you also must choose a password the first time you log in.

Changing your password later is done by selecting change password.



After logging in, a function menu appears.



System overview

First page show time, digital input, network, relay output and if there are alarms.

System overview

System operational

Alarms

Error code	Name	Description	Timestamp
33	SYNC RESTORED	Local clock is synchronized	2025-12-09 11:06:15

Clear all

Time

Current system time: 2025-12-09 11:06:46 (CET)

Time source: Internal clock

Synchronization status: **Free running**

Stratum: 8

Network

Ethernet status: **Connected**

Ethernet IP address: 192.168.2.234

WiFi status: Disabled

WiFi IP address: N/A

Digital input

Input 1: Off

Input 2: Off

Relay output

Edit rules

Relay 1: **Mode: Auto** Off Manual ON Manual OFF Auto

Relay 2: **Mode: Auto** Off Manual ON Manual OFF Auto

You can edit the rules for the relay outputs from this page.

Relay output

Edit rules

Relay 1: **Mode: Auto** Off Manual ON Manual OFF Auto

Relay 2: **Mode: Auto** Off Manual ON Manual OFF Auto

You can also change the language.

Svenska

- English
- Deutsch
- Svenska**
- Nederlands
- Français



System status

Under system status, you can view management cards, networks, performance metrics, events, audit records, logs, and NTP clients.

System status

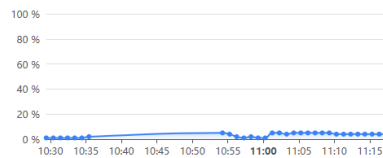
- Management board
- Network
- Performance metrics
- Events
- Audit records
- Logs
- NTP clients

Management board

System status

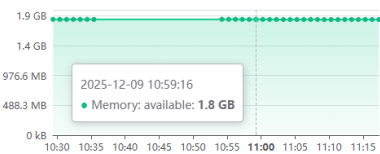
CPU: usage

4 %



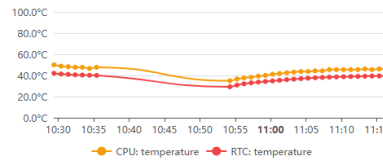
Memory: available

1934748 kB



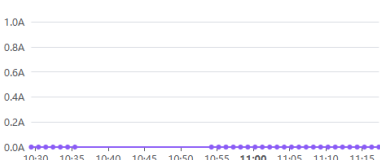
Temperature

CPU: temperature: **46.1 °C** RTC: temperature: **39.8 °C**

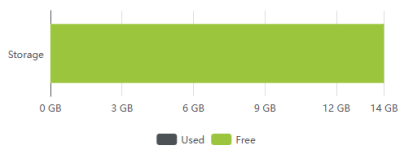


Impulse output: current

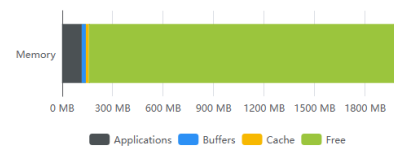
0.0 A



Storage



Memory



Connection status

Uptime 0d 0h 8m 6s



Network

Network status

Ethernet		WiFi	
Status:	Connected	Status:	Disabled
Link speed:	100 Mbps	Link speed:	N/A
Received bytes:	2.0 MB	Received bytes:	0 B
Transmitted bytes:	5.4 MB	Transmitted bytes:	0 B
Received packets:	15896	Received packets:	0
Transmitted packets:	2059	Transmitted packets:	0

IP routes

IPv4 Routes

Destination	Mask	Gateway	Metric	Interface
0.0.0.0	0.0.0.0	192.168.1.1	0	eth0
192.168.0.0	255.255.240.0	0.0.0.0	0	eth0
10.101.101.0	255.255.255.0	0.0.0.0	0	usb0

IPv6 Routes

Destination	Prefix length	Gateway	Metric	Interface
::	0	::	4294967295	lo
:::1	128	::	0	lo
::	0	::	4294967295	lo

Performance metrics

Performance metrics

CPU: load average (1 minute)

Controls

Metric: CPU: load average (1 minute) [v]

Time frame: Last hour [v]

Custom range

From: [Select start date] To: [Select end date]

[Apply custom range]

Refresh data

Metric info

Current value	0
Average	0
Minimum	0
Maximum	0



Events

Under events you can see which events have occurred, e.g. Alarm.

Events

ID ↑↓	Name ↑↓	Message	Severity ↑↓	Code ↑↓	Event time ↑↓
1	NO SYNC	Local clock is not synchronized	High	50	2026-04-17 15:20:17

<< < 1 > >> 50 ▾

First ID: Last ID: Not before: Not after:

Severity: All severiti... ▾

Audit records

Under review entries you can see who changed/updated and what was changed.

Audit records

ID ↑↓	User ↑↓	Client address ↑↓	Path	Message	Success ↑↓	Event time ↑↓
11	admin	192.168.2.76	/impulse-output	Impulse output configuration updated (type=7, duration=0, lowLimit=0, highLimit=0, overcurrentReset=300)	Success	2025-12-09 11:06:26
10	admin	192.168.2.76	/time-source	Time synchronization source changed to NONE, timeout=30 minutes	Success	2025-12-09 11:06:11
9	admin	192.168.2.76	/time-source	Time synchronization source changed to 1MIN_IMPULSE, timeout=30 minutes	Success	2025-12-09 11:04:41
8	admin	192.168.2.76	/impulse-output	Impulse output configuration updated (type=1, duration=20, lowLimit=0, highLimit=0, overcurrentReset=300)	Success	2025-12-09 11:01:57
7	(none)	192.168.2.76	/login	User "admin" logged in	Success	2025-12-09 11:00:57
6	admin	10.101.101.10	/relay-output	Set relay 1 control mode to AUTO	Success	2025-12-09 10:37:05
5	admin	10.101.101.10	/relay-output	Set relay 1 control mode to OFF	Success	2025-12-09 10:37:04
4	admin	10.101.101.10	/relay-output	Set relay 1 control mode to ON	Success	2025-12-09 10:37:04
3	(none)	10.101.101.10	/login	User "admin" logged in	Success	2025-12-09 10:36:56
2	admin	10.101.101.10	/system/firmware/upgrade	Firmware upgrade started via web API	Success	2025-12-09 10:35:47
1	(none)	10.101.101.10	/login	User "admin" logged in	Success	2025-12-09 10:35:27

<< < 1 > >> 20 ▾

First ID: Last ID: Not before: Not after: User name: All users



Administration

Under administration you can set time, time synchronization, impulse outputs, NTP and actions.

Time settings:

Sets the system time, location and time source. Time source; Internal clock, DCF77 (3-wire), GPS, Impulse (1 minute), Impulse (30 seconds), NTP and time code.

Time settings

Time settings

System time

🕒 2026-04-17 15:17:21 🇧🇪 CEST 🕒 +02:00 🌐 Set timezone 💻 Set to PC time 📅 Set time manually

Location

📍 59.329300, 18.068600 🔄 Automatic 🌐 View on map 📍 Set location

Time source

Sync source *Impulse (1 minute)*

Timeout *30m (m)*

🔄 Revert changes ✓ Save changes

Impulse output:

Sets pulse type, pulse length, high current limit, low current limit and overcurrent recovery time. Also available is clock control.

Impulse output

Impulse output

Configuration

Impulse type *TC (Time code)*

Impulse duration *2s (s)*

Current high limit *0A (A)*

Current low limit *0A (A)*

Overcurrent reset time *300s (s)*

🔄 Revert changes ✓ Save changes

Impulse clock control

Enter the time the impulse clock currently displays

🕒 01:47:00 Running 🛑 Stop 📅 Set time



Network:

Under Network, you set hostnames, ethernet settings, Wi-Fi settings and routes.

Network

Network

[General](#) [Ethernet](#) [WiFi](#) [Routes](#)

Hostname

[Revert changes](#) [Save changes](#)

NTP:

Sets up Server, client and keys.

NTP

[Server](#) [Client](#) [Keys](#)

Enabled *Off*

Allow all *Off*

Subnets

Broadcasts

Local stratum $\frac{2}{2}$

[Revert changes](#) [Save changes](#)



Actions:

Set rules and calendar. Under rules you set how the relay should work and under calendar you see which days it applies.

Actions

Rules Calendar

Rule configuration + Add rule

i
No rules configured

Advanced

Under advanced, you can set alarms, network, web server, SNMP, remote control, users, services, front panel, system and console.

Alarms

Under Alarms, you set alarms.

Alarm description	Alarm code ↑↓	Trap	Syslog	Indication	Manual clear	
Internal system error	01	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
WiFi connection is down	15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ethernet link is down	18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Local clock is not synchronized	32	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Local clock is synchronized	33	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
The RTC is not responding or is malfunctioning	39	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Revert changes Save changes



Web server

Under Web server, you can set HTTP and HTTPS and upload certificates.

Web server

HTTP

Enabled On

Port 80

HTTPS

Enabled On

Port 443

Revert changes

Save changes

Certificate

Expiration date: 2035-12-07
Expiration time: 2080632484
Issuer: C=SE,ST=Vastra Gotaland,L=Toreboda,O=Westerstrand,CN=TimeCentral
Subject: C=SE,ST=Vastra Gotaland,L=Toreboda,O=Westerstrand,CN=TimeCentral
Days until expiration: 3649

Upload a new certificate

Upload Certificate

File Text

Select certificate

Select key

Password (optional)

Upload



SNMP

Under SNMP, you set up SNMP and traps.

SNMP

General Traps

Location	<input type="text" value="undefined"/>
Contact	<input type="text" value="undefined"/>
Port	<input type="text" value="161"/>
Enabled Versions	<input checked="" type="checkbox"/> SNMPv1 <input checked="" type="checkbox"/> SNMPv2c <input type="checkbox"/> SNMPv3

Communities

+ Add community

Name	Actions
public	 





Revert changes

Save changes

Users

Under users, you add users.

Users

ID	Name	Description	Access level	
1	admin	Default administrator account	Administrator	 
2	operator	Default operator account	Guest	 

Add new user



Services

Under Services, you can disable and stop services.

Services

Front Panel Controller Running (0d 3h 32m 13s)	Disable	Stop
Impulse Output Driver Running (0d 3h 32m 13s)	Disable	Stop
LLDP Running (0d 3h 32m 13s)	Disable	Stop
mDNS Running (0d 3h 32m 12s)	Disable	Stop
NTP Running (0d 3h 19m 16s)	Disable	Stop
Performance Monitor Running (0d 3h 32m 13s)	Disable	Stop
SNMP Running (0d 3h 32m 13s)	Disable	Stop
SSH Running (0d 3h 32m 13s)	Disable	Stop
System Controller Running (0d 3h 32m 13s)	Disable	Stop
Web Server Running (0d 3h 32m 13s)	Disable	Stop

Front panel

Under the front panel, you set parameters for the screen.

Front panel screen

Idle screen brightness	<input type="text" value="10"/>	10%	(%)
Normal screen brightness	<input type="text" value="80"/>	80%	(%)
Screen inactivity timeout	<input type="text" value="600"/>	600s	(s)
Screen lock on boot	<input type="checkbox"/> Off		
Screen lock timeout	<input type="text" value="0"/>	0s	(s)
Screen unlock code	<input type="text" value="0000"/>	0000	

Revert changes

Save changes



System

Under system, you can restart the master clock or perform a factory reset and also perform a software update by updating the Firmware.

System

Reboot system
Restart the operating system 🔌 Reboot

Factory reset
Restart operating system and reset configuration to factory default 🗑️ Reset

Note: Both operations will temporarily interrupt network connectivity

System Language
System interface language English ✓ Save

Firmware details

Current firmware	1.2.18	Partition 2
Firmware partition 1	1.2.2	Set active
Firmware partition 2	Active	1.2.18
Upgrade firmware	+ Select firmware	

Configuration management

Full configuration 📄 Download + Upload

Action configuration 📄 Download + Upload

Diagnostics

Trace level

System diagnostics 0 📄 Download



Maintenance

A clean and fresh head clock is always a more representative product. The outer casing should therefore be cleaned regularly to keep the device in good condition.

Cleaning

Never spray cleaning agents directly onto the device. Cleaning agents should always be sprayed onto a cleaning cloth and then used to wipe the product clean. Almost all types of common all-purpose cleaners can be used to clean the exterior of the product. However, the cleaning agent must not dissolve or scratch the surface. If cleaning alcohol is used with a cotton swab, the swab should be damp and not so wet that it drips solution. Avoid ammonia-based solvents.

No other maintenance or service is required.



Technical specification

General

Art.nr.:	Time Control I
Accuracy:	+/-0.1 sec./24 h. (at +20°C, without external sync.)
Extern Synchronizing:	GPS, NTP, DCF-77 (Germany), Minute impulse and Time Code (TC). Programmable alarm limits
Running reserve:	Real time clock with 72 hours memory
Max. load clock output.:	1A. (The output is equipped with short circuit protection which resets automatically.)
Clock output:	Selectable 1/1-minute, 1/2-minute, second pulse, Time Code (TC). Programmable alarm limits.
Type of time:	Local time, Normal time and UTC (Coordinated universal time)
Impulse length:	Minute impulse: 2 sec. selectable 0.1 to 9.9 sec. Second impulse: 0.5 sec. selectable 0.1 to 1 sec.
Number of outputs:	2 closing potential-free contacts.
Max load/relay output:	230 V 10A
Program memory:	100 years (EEPROM)

Network

Protocols supported: (For time distribution)	NTP version 3 and 4, SNTPv4, and NTS Daytime Protocol (RFC867), Time Protocol (RFC 868)
Other supported protocols:	SNMP v1, v2, v3, MIB II (RFC1155, RFC1157, RFC1213), HTTP, HTTPS, Remote Syslog, SSH
Transport protocol:	TCP, UDP/IP, ICMP
Interna Protocol:	IPv4 / IPv6
NTP requests:	+ 10000/sec.
IP address assignment:	Dynamic, using DHCP, or fixed IP-address
Compatibility:	Ethernet version 2/IEEE 802.3
Ethernet:	Supports 10/100BASE-T (RJ45)
Device Management:	Web-Based via HTTP/HTTPS

Power supply

Supply voltage:	24VDC -5% +10% or 100 - 240V 50 Hz (depending of version)
Max rippel (24VDC):	0,7V RMS
Power consumption:	30 W (max)

Environmental

Temperature range:	0°C to +50°C
Relative humidity:	Max. 85%, non condensing
IP class:	IP 20

Housing

Housing:	Plastic
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